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(54) **Modular auxiliary electrical device particularly of the shunt-trip type**

(57) A modular auxiliary electrical device particularly of the shunt-trip type, comprising a box-like body which is adapted to be associated with an electrical device, such as a switch, and comprises an electrical connection means for connection to conducting components, the electrical connection means being connected to a kinematic means which is adapted to act on the associated electrical device; characterized in that it comprises a shunt-trip linkage which is rigidly coupled to a movable portion of an armature of a relay, the linkage being adapted to actuate the kinematic means when the circuit of the relay is closed.

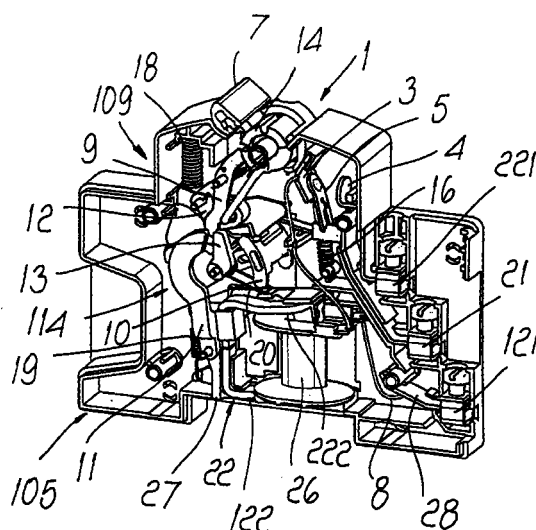


Fig. 1

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Description

[0001] The present invention relates to a modular auxiliary electrical device particularly of the shunt-trip type.

[0002] A device of this type is normally associated with a safety switch in order to allow remote opening of the switch, for example by means of an emergency stop button.

[0003] A constant problem in the design and production of this kind of device is to reduce as much as possible the mechanical and constructive complexity and the dimensions of the devices.

[0004] The need is constantly felt to simplify the kinematic systems from the constructive point of view in order to achieve cost-effective production, and in this regard it is also very important to achieve an assembly which is simple and can be automated.

[0005] Another problem is to improve the performance of the electrical devices while maintaining compact dimensions which in any case comply with the standards.

[0006] The aim of the present invention is to provide a modular auxiliary electrical device, particularly of the shunt-trip type, having improved electrical characteristics.

[0007] Another object of the present invention is to provide a modular auxiliary electrical device particularly of the shunt-trip type which can be manufactured more cheaply than conventional ones and at the same time offers improved performance.

[0008] Another object of the present invention is to provide a modular auxiliary electrical device particularly of the shunt-trip type which is more reliable in use.

[0009] This aim, these objects and others which will become better apparent hereinafter are achieved by a modular auxiliary electrical device particularly of the shunt-trip type, including a box-like body which is adapted to be associated with an electrical device, such as a switch, and comprises an electrical connection means for connection to conducting components, the electrical connection means being connected to a kinematic means which is adapted to act on the associated electrical device; characterized in that it comprises a shunt-trip linkage which is rigidly coupled to a movable portion of an armature of a relay, the linkage being adapted to actuate the kinematic means when the circuit of the relay is closed.

[0010] Further characteristics and advantages of the present invention will become apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a cutout perspective view of the device according to the invention;

Figure 2 is a side elevation view of the device

according to the invention, with one wall of the box-like body removed, illustrating the kinematic system in the closed position;

Figure 3 is a view, similar to Figure 2, of the kinematic system in the open position;

Figure 4 is a view, similar to Figure 3, of the kinematic system in the tripped closed position.

[0011] With reference to the above figures, the modular auxiliary electrical device particularly of the shunt-trip type according to the invention, generally designated by the reference numeral 100, substantially comprises a containment body 1 which has the typical standardized shape and forms, at the rear face 105, a means for coupling to an omega-shaped guide (not shown) according to DIN standards.

[0012] The containment body 1 has, at its front face, a protrusion 109 in which the actuation member or actuation lever 14 is located.

[0013] The containment body 1 contains an electrical actuation member, constituted by a relay generally designated by the reference numeral 110, which is associated with a kinematic trip system 114 and with the terminals 21, 121, 221 for the external electrical connections.

[0014] The actuation lever 14 comprises a lever cover 7 and a lever spring 17 which is coaxial to the lever. The lever 14 is connected to a driving linkage 12 by means of a lever crossbar 30. The driving linkage 12 acts by means of a driving spring 18. The kinematic system 114 also comprises an engagement linkage 9 which is pivoted in a pivot 24 and acts in contrast with, or through the action of, an engagement spring 15. A movement linkage 10 is pivoted on the same pivot as a release linkage 13 and is kept in position by a movement spring 20. The relay 110 comprises a coil support 27 comprising a relay spool 26 and a relay core 22. A first end of the wire of the winding of the coil is connected to an output terminal 28 thanks to a relay connecting wire 8. A second end of the winding wire is connected to a first fixed contact 3. A moving contact 5 is movable, in contrast with and through the action of a contact spring 16, between a position for contact with the first fixed contact 3 (closed position of the kinematic system), shown in Figure 2, and a position for contact with a second fixed contact 4 (open position of the kinematic system, shown in Figure 3, and closed tripped position of the kinematic system, shown in Figure 4) through the action of the driving linkage 12.

[0015] The second fixed contact 4 is electrically connected to the external terminal 221.

[0016] The movement linkage 10 comprises a slot 111 which is adapted to receive an actuation pivot of an adjacent device and, on the opposite side, a pivot for actuating an adjacent device.

[0017] The relay core 22 is composed of a lower fixed part 122 and of an upper movable part 222, with which a shunt-trip linkage 11 is rigidly coupled; the link-

age is actuated by a relay spring 19 and is adapted to actuate the kinematic system 114.

[0018] By actuating the lever 14, the device is moved from the open position of the kinematic system, shown in Figure 3, to the closed position of the kinematic system, shown in Figure 2. In case of intervention, for example if an emergency button electrically connected to the terminals 21 and 121 is operated, the armature of the relay 110 closes, i.e., the upper movable part 222 moves downwards, with reference to the figures, and moves the shunt-trip linkage 11, which acts on the kinematic system 114 so as to open the contact. In this manner, while the pivot of the movement linkage acts on the associated switch, making it trip, the moving contact 5 separates from the first fixed contact 3 and rests on the second fixed contact 4. In this manner, the circuit of the coil of the relay is interrupted. Moreover, since the moving contact is now in contact with the second fixed contact 4, current is supplied to the terminal 221, optionally connected to an external signaling device, for example a warning light, which reports that the device has intervened.

[0019] In order to reset the device it is necessary to return the lever from the open position to the closed position and then reset the switch.

[0020] In practice it has been observed that the invention achieves the intended aim and objects.

[0021] The modular auxiliary electrical device particularly of the shunt-trip type according to the invention is susceptible of numerous modifications and variations, within the scope of the appended claims. All the details may be replaced with other technically equivalent elements.

[0022] The materials used, as well as the dimensions, may of course be any according to requirements and to the state of the art.

3. The device according to claim 1 or 2, characterized in that said relay comprises a spool for a coil and a coil support, said coil support comprising a wider portion which is adapted to contain said movable part so as to limit the opening of said movable part.

Claims

1. A modular auxiliary electrical device particularly of the shunt-trip type, comprising a box-like body which is adapted to be associated with an electrical device, such as a switch, and comprising an electrical connection means for connection to conducting components, said electrical connection means being connected to a kinematic means which is adapted to act on said associated electrical device; characterized in that it comprises a shunt-trip linkage which is rigidly coupled to a movable portion of an armature of a relay, said linkage being adapted to actuate said kinematic means when the circuit of said relay is closed.
2. The device according to claim 1, characterized in that said relay comprises a relay core which is composed of a lower fixed part and an upper fixed part with which said shunt-trip linkage is rigidly coupled, said linkage being actuated by a relay spring.

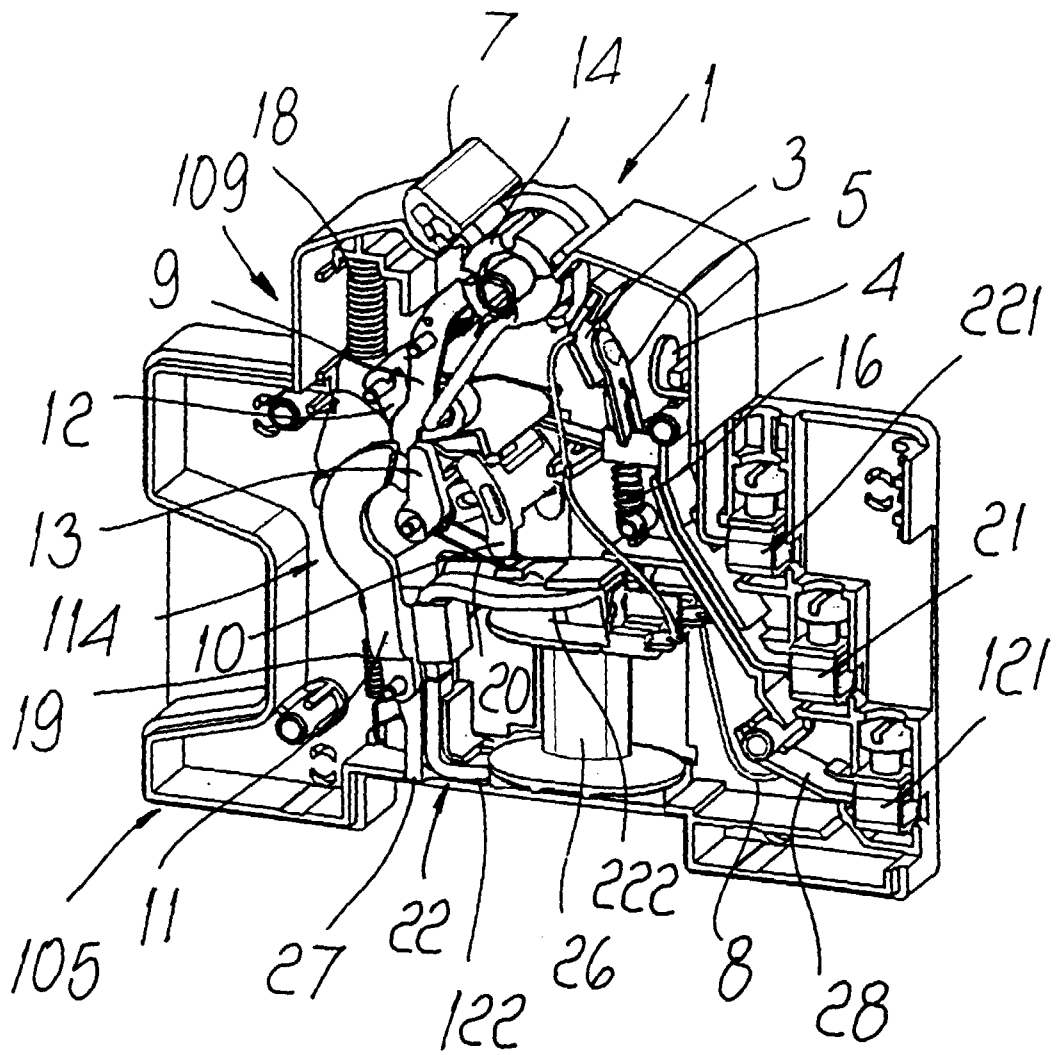
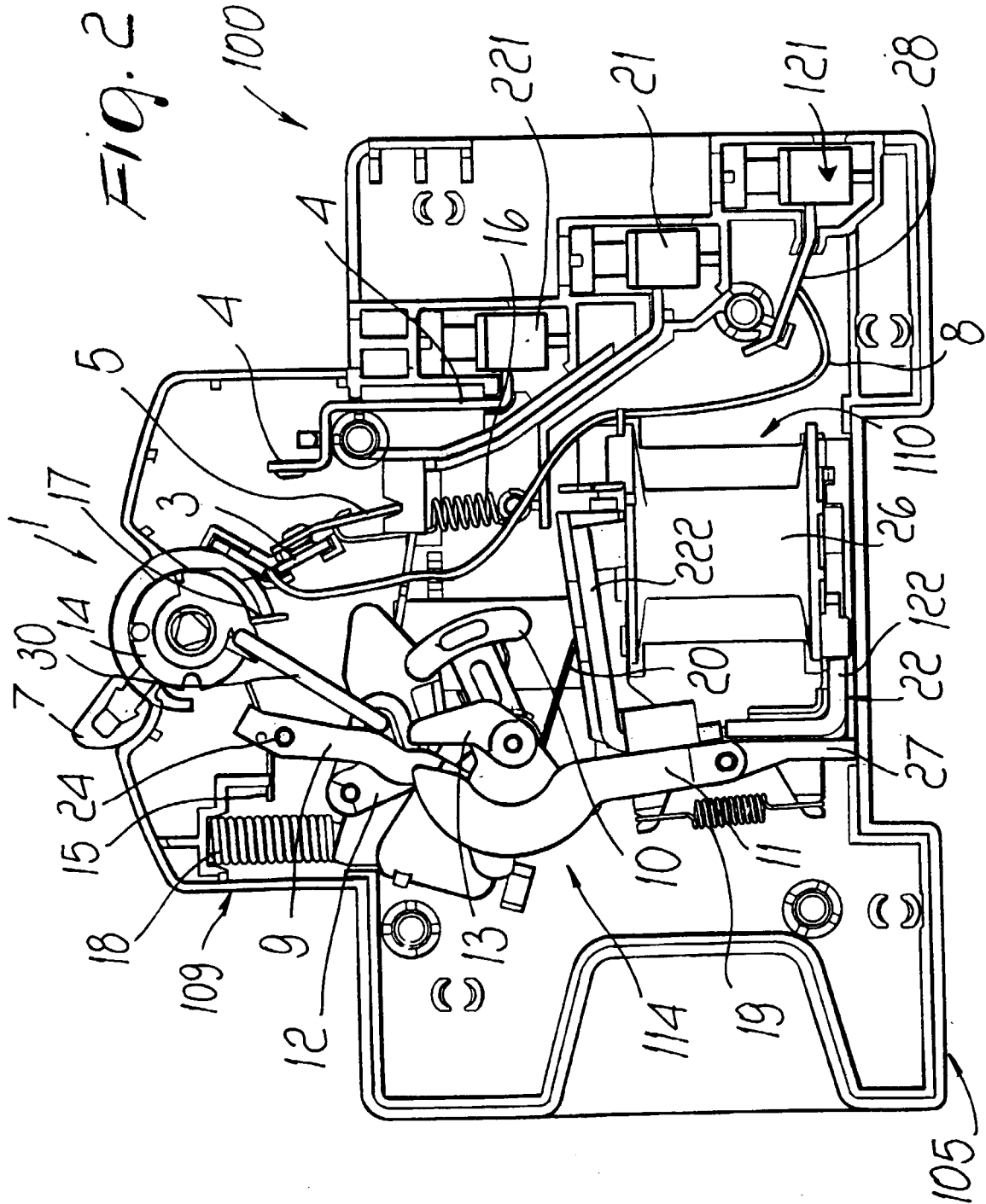
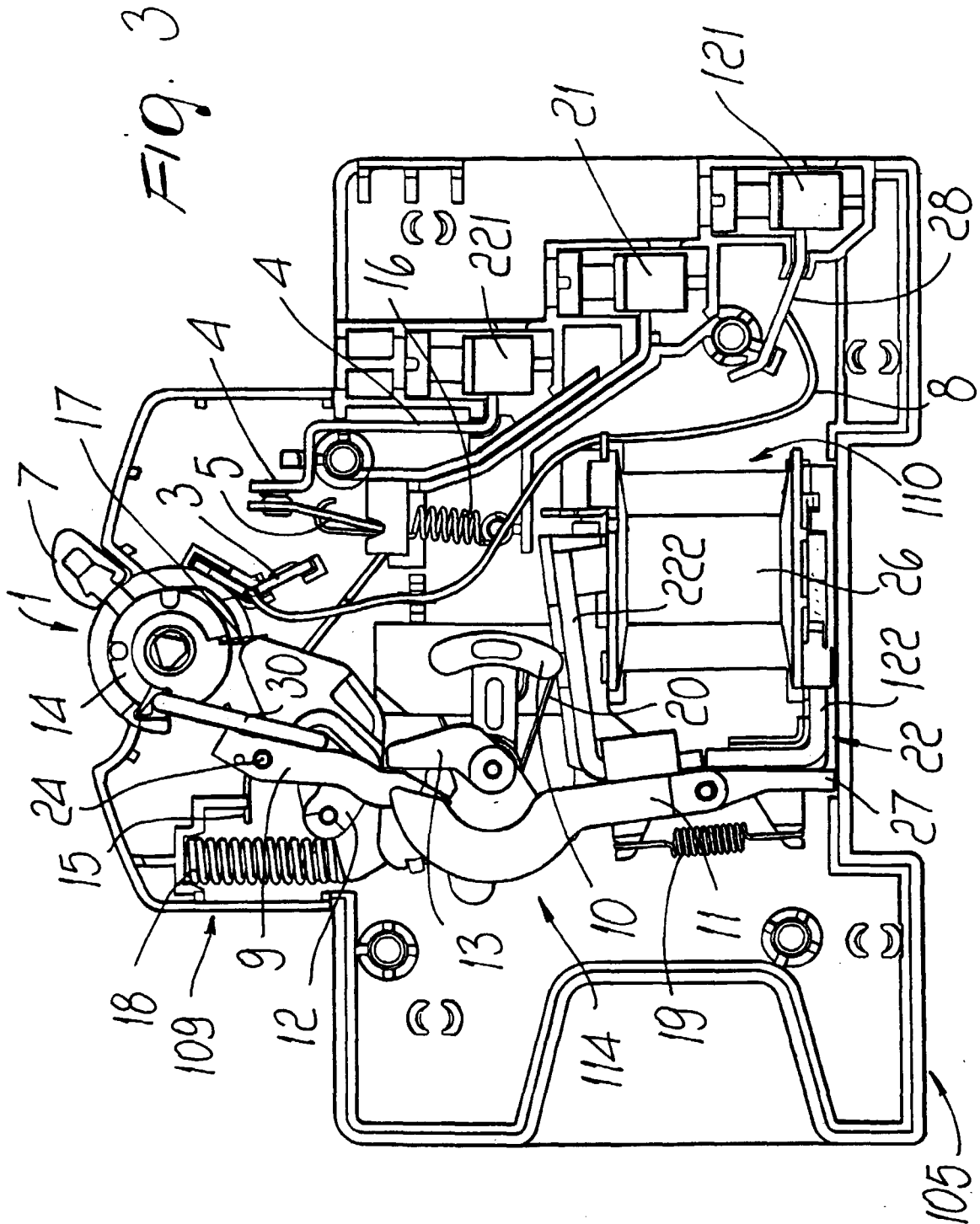
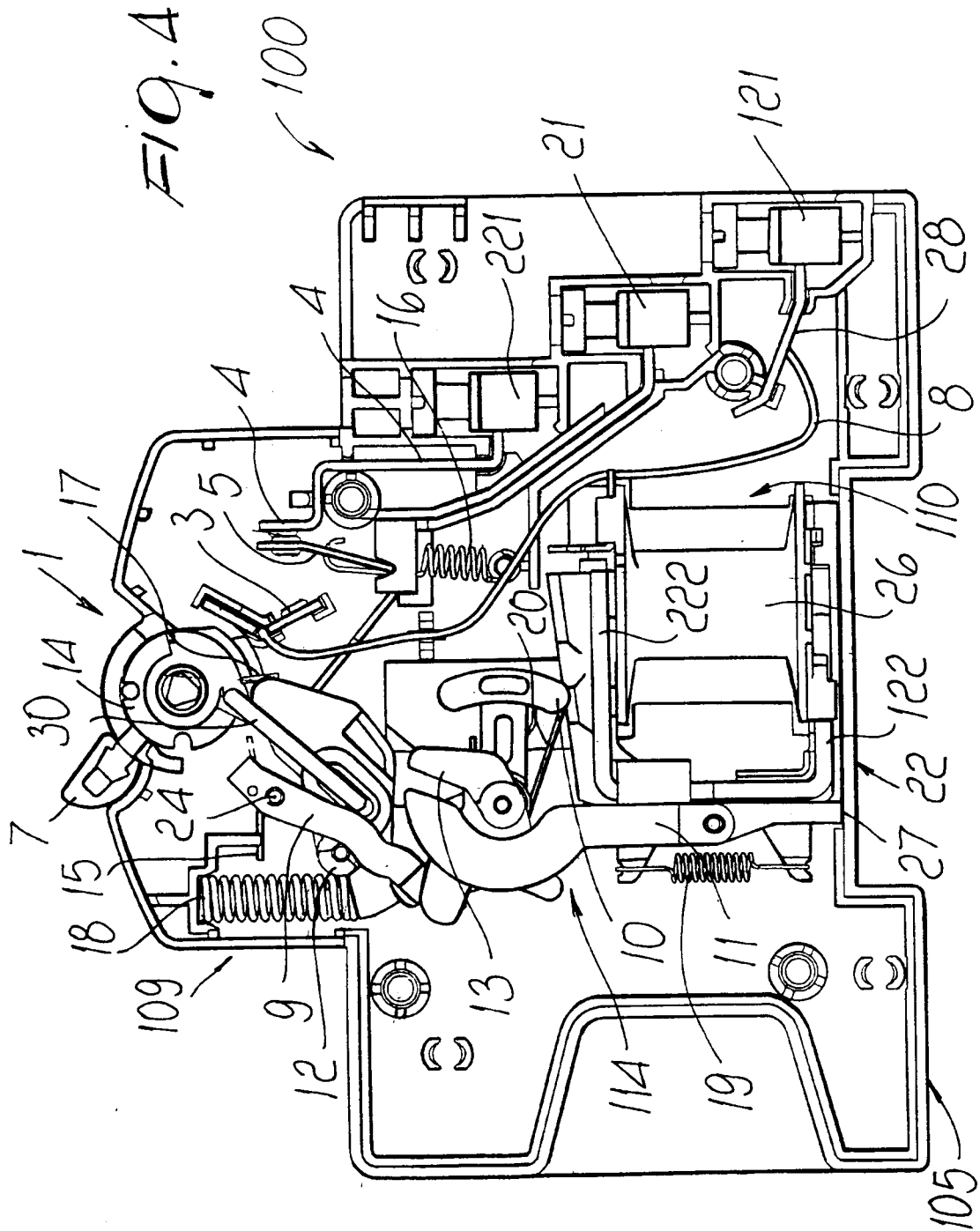


FIG. 1









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EUROPEAN SEARCH REPORT

Application Number
EP 00 11 0340

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 3 369 202 A (GRYCKO CARL E) 13 February 1968 (1968-02-13) * column 5, line 57 - column 7, line 18; figures 5,6 *	1-3	H01H83/20
X	FR 2 684 231 A (HAGER ELECTRO) 28 May 1993 (1993-05-28) * page 13, line 11 - page 14, line 14; figures 7,8 *	1-3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			H01H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 1 August 2000	Examiner Ramírez Fueyo, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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01-08-2000

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